CLAIMS

What is claimed is:

1. A method for managing access to a resource, the method comprising the computer-implemented steps of:

sending from a requestor to a master of the resource a lock mode request for a lock mode on the resource;

receiving the resource at the requestor from a holder of the resource; and

accessing the resource as if the requestor had been granted the lock mode request without waiting to receive an express lock mode grant from the master.

2. The method of Claim 1 further comprising the computer-implemented steps of:

detecting whether the step of receiving the resource at the requestor will occur; and

if the requestor does receive the resource

sending a lock assume message from the requestor to the master to inform the master that the requestor has assumed the lock mode relative to the resource.

3. A method for managing access to a resource, the method comprising the computer-implemented steps of:

receiving at a holder an inform lock holder message that a requestor needs the resource, where the holder currently holds the resource and a first lock mode on the resource;

transferring the resource to the requestor in response to receiving the inform lock holder message without sending a status message to a master of the resource wherein the status message is a down-convert message or a release lock message; and

updating a lock mode record, maintained by the holder, to indicate that the holder has down-converted from the first lock mode to a second lock mode for the resource.

4. The method for Claim 3 further comprising the computer-implemented steps of:

sending an update lock message to the master wherein the update lock message indicates the second lock mode for the resource.

5. The method for Claim 3 further comprising the computer-implemented steps of:

receiving at the holder a message from a sender;

wherein the message includes a third lock mode on the resource;

detecting that the first lock mode and the third lock mode do not match; and

sending a lock status message to the sender;

wherein the lock status message includes the first lock mode.

6. The method for Claim 3 further comprising the computer-implemented steps of:

receiving at the holder a single batched inform lock holder message that contains all information necessary to transfer the resource to a plurality of requestors; and

transferring the resource to the plurality of requestors.

7. The method for Claim 3 further comprising the computer-implemented steps of:

sending a lock access message from the holder to a master.

8. A method for managing access to a resource, the method comprising the computer-implemented steps of:

receiving at a master a request message which indicates that a requestor needs a particular resource of a plurality of resources, where the master maintains a plurality of lock

mode records corresponding to the plurality of resources;

sending from the master to a holder an inform lock holder message to indicate to the holder that the requestor needs the particular resource;

receiving a lock access message from the requestor where the lock access message indicates that the requestor has assumed a lock mode relative to the particular resource; and

performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the lock access message;

wherein the update indicates that the requestor has assumed the lock mode on the particular resource.

9. A method for Claim 8 wherein the computer-implemented step of performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the plurality of lock mode records in response to receiving the lock access message:

is performed prior to receiving any status message from the holder relating to the particular resource;

wherein the status message is a down-convert

message or a release lock message.

10. A method for Claim 8 wherein the computer-implemented step of performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the plurality of lock mode records in response to receiving the lock access message:
is performed without receiving the status message from
the holder relating to the particular resource;
wherein the status message is a down-convert
message or a release lock message.

11. The method for Claim 8 further comprising the computer-implemented step of:
receiving at the master a plurality of request
messages which indicate that a plurality of requestors
need the particular resource; and
sending from the master to the holder the inform
lock holder message wherein the inform lock holder
message contains all information from the plurality of
request messages that is necessary for the holder to
transfer the particular resource to the plurality of
requestors.

12. The method for Claim 8 further comprising the computer-implemented step of:

receiving at the master a message from a sender;

wherein the message includes a second lock mode on the particular resource;

detecting that the lock mode and the second lock mode do not match; and

sending a lock status message to the sender;

wherein the lock status message includes the lock mode.

13. The method for Claim 8 further comprising the computer-implemented step of:

receiving at the master a second request message;

wherein the request message and the second request message both contain requests for the resource in exclusive lock mode; and

queueing the second request message until the master receives the lock access message from the requestor.

14. A method for managing access to a resource, the method comprising the computer-implemented steps of:

receiving at a master a request message which indicates that a requestor needs a particular resource of a plurality of resources, where the master maintains a plurality of lock mode records corresponding to the plurality of resources;

designating one holder out of a plurality of holders wherein the plurality of holders all have respective lock modes for the particular resource;

sending a plurality of broadcast inform lock holder messages to the plurality of holders except for the one holder indicating that the requestor needs the particular resource;

receiving a plurality of update lock messages from the plurality of holders except for the one holder;

wherein the a plurality of update lock messages indicates the respective lock modes of the plurality of holders;

sending from the master to the one holder an inform lock holder message to indicate to the one holder that the requestor needs the particular resource;

receiving a lock access message from the requestor where the lock access message indicates that the requestor has assumed a lock mode relative to the particular resource; and

performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the lock access message without receiving a status message;

wherein the status message is a down-convert message or a release lock message;

wherein the update indicates that the requestor has assumed the lock mode on the particular resource.

15. A computer system comprising:

a processor;

a memory having stored instructions of the computer system causing the processor to perform the computer-implemented steps of:

sending from a requestor to a master of a resource a lock mode request for the lock mode on the resource;

receiving the resource at the requestor from a holder of the resource; and

accessing the resource as if the requestor had been granted the lock mode request without waiting to receive an express lock mode grant from the master.

16. The computer system of Claim 15 wherein the memory having stored instructions of the computer system causing the processor to perform the computer-implemented steps further comprising the computer-implemented step of:

detecting whether the step of receiving the resource at the requestor will occur; and

if the requestor does receive the resource;

sending a lock assume message from the requestor to the master to inform the master that the requestor has assumed the lock mode relative to the resource.

17. A computer system comprising:

a processor;

a memory, coupled to the processor,

containing:

a particular lock mode record of a plurality of lock mode

records corresponding to a lock mode of a particular resource of a plurality of resources, where a master maintains the plurality of lock mode records corresponding to the plurality of resources;

having stored instructions of the computer system causing the processor to perform the computer-implemented steps of:

receiving at the master a request message which indicates that a requestor needs the particular resource of the plurality of resources, where the master maintains the plurality of lock mode records corresponding to the plurality of resources;

sending from the master to a holder an inform lock holder message to indicate to the holder that the requestor needs the particular resource;

receiving a lock access message from the requestor where the lock access message indicates that the requestor has assumed the lock mode relative to the particular resource; and

performing an update to the particular lock

mode record of the plurality of lock mode records in response to receiving the lock access message without receiving a status message;

wherein the status message is a down-convert message or a release lock message;

wherein the update indicates that the requestor has assumed the lock mode on the particular resource.

18. The computer system for Claim 17 wherein the computer-implemented step of performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the lock access message:

is performed prior to receiving any status message from the holder relating to the particular resource wherein the status message is a down-convert message or a release lock message.

19. The computer system for Claim 17 wherein the computer-

implemented step of performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the plurality of lock mode records in response to receiving the lock access message:

is performed without receiving the status message from the holder relating to the particular resource wherein the status message is a down-convert message or a release lock message.

20. The computer system of Claim 17 wherein the memory having stored instructions of the computer system causing the processor to perform the computer-implemented steps further comprising the computer-implemented step of:

receiving at the master a plurality of request messages which indicate that a plurality of requestors need the particular resource; and

sending from the master to the holder the inform lock holder message wherein the inform lock holder message contains all information from the plurality of request messages that is necessary for the holder to transfer the particular resource to the plurality of requestors.

21. The computer system of Claim 17 wherein the memory having stored instructions of the computer system causing the processor to perform the computer-implemented steps further comprising the computer-implemented step of:

receiving at the master a message from a sender;

wherein the message includes a second lock mode on the particular resource;

detecting that the lock mode and the second lock mode do not match; and

sending a lock status message to the sender

wherein the lock status message includes the lock mode.

22. The computer system for Claim 17 further comprising the computer- implemented step of:

receiving at the master a second request message

wherein the request message and the second request message both contain requests for the resource in exclusive lock mode; and

queueing the second request message until the master receives the lock access message from the requestor.

23. A computer system comprising:

a processor;

a memory, coupled to the processor,

containing:

a particular lock mode record of a plurality of lock mode records corresponding to a lock mode of a particular resource of a plurality of resources, where a master maintains the plurality of lock mode records corresponding to the plurality of resources;

having stored instructions of the computer system causing the processor to perform the computer-implemented steps of:

receiving at a master a request message which indicates that a requestor needs the particular resource of the plurality of resources, where the master maintains the plurality of lock mode records corresponding to the plurality of resources;

designating one holder out of a plurality of holders wherein the plurality of holders all have respective lock modes for the particular resource;

sending a plurality of broadcast inform lock

holder messages to the plurality of holders except for the one holder indicating that the requestor needs the particular resource;

receiving a plurality of update lock messages from the plurality of holders except for the one holder wherein the plurality of update lock messages indicates the respective lock modes of the plurality of holders;

sending from the master to the one holder an inform lock holder message to indicate to the one holder that the requestor needs the particular resource;

receiving a lock access message from the requestor where the lock access message indicates that the requestor has assumed the lock mode relative to the particular resource; and

performing an update to the particular lock mode record of the plurality of lock mode records in response to receiving the lock

access message without receiving a status message;

wherein the status message is a down-convert message or a release lock message;

wherein the update indicates that the requestor has assumed the lock mode on the particular resource.

24. A computer system comprising:

a processor;

a memory, coupled to the processor,

containing:

a resource and a first lock mode on the resource; and

a lock mode record associated with the resource;

having stored instructions of the computer system causing the processor to perform the computer-implemented steps of:

receiving at a holder an inform lock holder message that a requestor needs the resource, where the holder currently holds the resource and the first lock mode on the resource;

transferring the resource to the requestor in response to receiving the inform lock holder message without sending a status message to a master of the resource wherein the status message is a down-convert message or a release lock message; and

updating the lock mode record, maintained by the holder, to indicate that the holder has down-converted from the first lock mode to a second lock mode for the resource.

25. The computer system of Claim 24 wherein the memory having stored instructions of the computer system causing the processor to perform the computer-implemented steps further comprising the computer-implemented steps of:

sending an update lock message to the master wherein the update lock message indicates the second lock mode for the resource.

26. The computer system of Claim 24 wherein the memory having stored instructions of the computer system causing the

processor to perform the computer-implemented steps further comprising the computer-implemented steps of:

receiving at the holder a message from a sender;

wherein the message includes a third lock mode on the resource;

detecting that the first lock mode and the third lock mode do not match; and

sending a lock status message to the sender,

wherein the lock status message includes the first lock mode.

27. The computer system of Claim 24 wherein the memory having stored instructions of the computer system causing the processor to perform the computer-implemented steps further comprising the computer-implemented steps of:

receiving at the holder a single batched inform lock holder message that contains all information necessary to transfer the resource to a plurality of requestors; and

transferring the resource to the plurality of requestors.

28. A computer-readable medium carrying one or more sequences of instructions for managing access to a resource, wherein execution of the one or more

sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

sending from a requestor to a master of the resource a lock mode request for a lock mode on the resource;

receiving the resource at the requestor from a holder of the resource; and

accessing the resource as if the requestor had been granted the lock mode request without waiting to receive an express lock mode grant from the master.

29. The computer-readable medium of Claim 28 further comprising the sequence of instructions for performing the steps of:

detecting whether the step of receiving the resource at the requestor will occur; and

if the requestor does receive the resource;

sending a lock assume message from the requestor to the master to inform the master that the requestor has assumed the lock mode relative to the resource.

30. A computer-readable medium carrying one or more sequences of instructions for managing access to a resource, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

receiving at a holder an inform lock holder message that a requestor needs the resource, where the holder currently holds the resource and a first lock mode on the resource;

transferring the resource to the requestor in response to receiving the inform lock holder message without sending a status message to a master of the resource wherein the status message is a down-convert message or a release lock message; and

updating a lock mode record, maintained by the holder, to indicate that the holder has down-converted from the first lock mode to a second lock mode for the resource.

31. The computer-readable medium of Claim 30 further comprising the sequence of instructions for performing the steps of:

sending an update lock message to the master wherein the update lock message indicates the second lock mode for the resource.

32. The computer-readable medium of Claim 30 further comprising sequences of instructions for performing the steps of:

receiving at the holder a message from a sender;

wherein the message includes a third lock mode on the resource;

detecting that the first lock mode and the third lock mode do not match; and

sending a lock status message to the sender;

wherein the lock status message includes the first lock mode.

33. The computer-readable medium of Claim 30 further comprising sequences of instructions for performing the steps of:

receiving at the holder a single batched inform lock holder message that contains all information necessary to transfer the resource to a plurality of requestors; and

transferring the resource to the plurality of requestors.

34. The method for Claim 30 further comprising the computer-implemented steps of:

sending a lock access message from the holder to a master.

35. A computer-readable medium carrying one or more sequences of instructions for managing access to a resource, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

receiving at a master a request message which indicates that a requestor needs a particular resource of a plurality of resources, where the master maintains a plurality of lock mode records corresponding to the plurality of resources;

sending from the master to a holder an inform lock holder message to indicate to the holder that the requestor needs the particular resource;

receiving a lock access message from the requestor where the lock access message indicates that the requestor has assumed a lock mode relative to the particular resource; and

performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the lock access message;

wherein the update indicates that the requestor has assumed the lock mode on the particular resource.

36. The computer-readable medium of Claim 35 wherein the step of performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the lock access message:

is performed prior to receiving any status message from the holder relating to the particular resource; wherein the status message is a down-convert message or a release lock message.

37. The computer-readable medium of Claim 35 wherein the step of performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the plurality of lock mode records in response to receiving the lock access message:

is performed without receiving the status message from the holder relating to the particular resource; wherein the status message is a down-convert message or a release lock message.

38. The computer-readable medium of Claim 35 further comprising sequences of instructions for performing the step of:

receiving at the master a plurality of request messages which indicate that a plurality of requestors need the particular resource; and

sending from the master to the holder the inform lock holder message wherein the inform lock holder message contains all information from the plurality of

request messages that is necessary for the holder to transfer the particular resource to the plurality of requestors.

39. The computer-readable medium of Claim 35 further comprising sequences of instructions for performing the step of:

receiving at the master a message from a sender;

wherein the message includes a second lock mode on the particular resource;

detecting that the lock mode and the second lock mode do not match; and

sending a lock status message to the sender;

wherein the lock status message includes the lock mode.

40. The computer-readable medium of Claim 35 further comprising sequences of instructions for performing the step of:

receiving at the master a second request message;

wherein the request message and the second request message both contain requests for the resource in exclusive lock mode;

queueing the second request message until the master

receives the lock access message from the requestor.

41. A computer-readable medium carrying one or more sequences of instructions for managing access to a resource, wherein execution of the one or more sequences of instructions by one or more processors causes the one or more processors to perform the steps of:

receiving at a master a request message which indicates that a requestor needs a particular resource of a plurality of resources, where the master maintains a plurality of lock mode records corresponding to the plurality of resources;

designating one holder out of a plurality of holders wherein the plurality of holders all have respective lock modes for the particular resource;

sending a plurality of broadcast inform lock holder messages to the plurality of holders except for the one holder indicating that the requestor needs the particular resource;

receiving a plurality of update lock messages from the plurality of holders except for the one holder;

wherein the a plurality of update lock messages

indicates the respective lock modes of the plurality of holders;

sending from the master to the one holder an inform lock holder message to indicate to the one holder that the requestor needs the particular resource;

receiving a lock access message from the requestor where the lock access message indicates that the requestor has assumed a lock mode relative to the particular resource; and

performing an update to a particular lock mode record of the plurality of lock mode records in response to receiving the lock access message without receiving a status message;

wherein the status message is a down-convert message or a release lock message;

wherein the update indicates that the requestor has assumed the lock mode on the particular resource.